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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
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EXAMINER

KANG, INSUN

ART UNIT	PAPER NUMBER
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2193

DATE MAILED: 06/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/016,949

Applicant(s)

FAHS ET AL.

Examiner

Insun Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the amendment filed 3/3/2006.
2. As per applicant's request, claims 1, 7, 13, 20, 22, and 24 have been amended.

Claims 1-24 are pending in the application.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Per claims 1, 7, and 13, the claim limitation "identifying an inlined function in source code for a binary executable" is unclear as to which "source code for a binary executable" it is referring. In the instant specification, the location information for the inlined function is contained within the executable (page 8-9). Therefore, it is unclear whether the source code is meant to be the executable. It is interpreted as: identifying an inlined function in a binary executable."

As per claims 2-6, 8-12, and 14-24, these claims are rejected for dependency on the above rejected parent claims.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Hundt ("HP Caliper – An Architecture for Performance Analysis Tools," 10/2000).

Per claim 1:

Hundt discloses:

- identifying an inlined function in source code for a binary executable (i.e. "Probes are inlined into functions and instrumented functions are relocated...Function entry points are identified by analysis of the unwind information tables (sometimes called exception tables), the procedure lookup tables, and the symbol table...The analysis may still miss some function entry points because of a lack of unwind information and symbolic information. However, these functions are discovered dynamically. Whenever a call target cannot be found in the internal function dictionary during instrumentation, a break is inserted at the target address of a call branch, assuming it to be a function entry point," section 4.1 Algorithm)
- inserting a breakpoint at the start of said inlined function in said binary executable; i.e. "Probes are inlined into functions and instrumented functions are relocated...Every function's entry point is patched with a break instruction," section 4.1 Algorithm)
- replacing said inlined function with a long branch to a shared memory probe code sequence (i.e. "original function's entry point is patched with a long branch instruction to its instrumented version (page 5, 4.1 Algorithm)."

Per claim 2:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

-creating a data structure which maintains location information for said inlined function and information related to said desired task for said inlined function (i.e. "The function is analyzed for instrumentability, probe codes are inlined into the function, IP-relative references are updated, counters are created, and an instrumented version of the function is moved to shared memory. The original function's entry point is patched with a long branch instruction to its instrumented version," section 4.1 Algorithm) as claimed.

Per claim 3:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

-using said performance analysis tool to perform instrumentation on said inlined function (i.e. "The process runs until it hits one of the inserted break instructions at the entry point of a function...and the instrumentation process begins at the current function," section 4.1. Algorithm) as claimed.

Per claim 4:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

- using said performance analysis tool to perform mapping of samples to said inlined function (i.e. "The Caliper Support Library offers a framework of services and tools for dynamic instrumentation and sampling," page 3 last paragraph; "a strong set of tools

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and methods used to analyze and monitor run-time behavior of a program. Statistical sampling and binary instrumentation are two of the major techniques," page 1 paragraph 4) as claimed.

Per claim 5:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

- said performance analysis tool is comprised of an instrumentation application (i.e. "The Caliper Support Library offers a framework of services and tools for dynamic instrumentation and sampling," page 3 last paragraph; "a strong set of tools and methods used to analyze and monitor run-time behavior of a program. Statistical sampling and binary instrumentation are two of the major techniques," page 1 paragraph 4) as claimed.

Per claim 6:

The rejection of claim 1 is incorporated, and further, Hundt teaches:

- said performance analysis tool is comprised of a sampling application (i.e. "The Caliper Support Library offers a framework of services and tools for dynamic instrumentation and sampling," page 3 last paragraph; "a strong set of tools and methods used to analyze and monitor run-time behavior of a program. Statistical sampling and binary instrumentation are two of the major techniques," page 1 paragraph 4) as claimed.

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Per claims 7-12, they are the computer-readable medium versions of claims 1-6, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-6 above.

Per claims 13-18, they are the apparatus versions of claims 1-6, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-6 above.

Per claim 19:

The rejection of claim 1 is incorporated, and further, Hundt teaches: said shared memory probe code sequence saves registers, executes the original bundle of said inlined function, restores said registers, and jumps back to said computer code (i.e. "HP Caliper", 4.1 Algorithm).

Per claim 20:

The rejection of claim 1 is incorporated, and further, Hundt teaches: reading source correlation information from within said binary executable; and obtaining start and end addresses for said inlined function using said source correlation information (i.e. "HP Caliper", 4.1 Algorithm).

Per claims 21-22, they are the computer-readable medium versions of claims 19-20, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 19-20 above.

Per claims 23-24, they are the apparatus versions of claims 19-20, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 19-20 above.

Response to Amendment

7. The amendments to the claims filed on 3/3/2006 do not comply with the requirements of 37 CFR 1.121(c) because:

Per claims 19, 21, and 23: these claims had been added on 8/18/2005. Therefore, the identifier, "previously presented" needs to be used. Clarification is requested.

Response to Arguments

8. Applicant's arguments filed 3/3/2006 have been fully considered but they are not persuasive.

Per claims 1, 7, and 13:

The Applicant now states Hundt does not disclose or suggest "identifying an inlined function in source code for a binary executable; inserting a breakpoint at the start of said inlined function in said binary executable."

In response, the instant specification does not support the details of how such identifying step that is distinct from the prior art is performed. Although the specification discloses the data structure that maintains the start and end addresses for the inlined

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function (page 10), it does not state how the identifying step specifically for the inlined function is performed first in order to maintain the start and end points for the inlined function. Therefore, the identifying step is considered to be same as Caliper's function discovery step identifying function entry points. The dynamic instrumentation in Caliper performs such function discovery wherein function entry points are identified by analysis of the unwind information tables, the procedure lookup tables, and the symbol table. The functions whose function entry points are missed because of a lack of unwind information and symbolic information are discovered dynamically (see 4.1). For a call target that cannot be found in the internal function dictionary during instrumentation, a break is inserted at the target address of a call branch, assuming it to be a function entry point (see 4.1). Therefore, all function entry points are considered to be identified regardless. Further, after identifying an executable, Caliper attach and injects code into the process which allocates shared memory. Every functions' entry point is patched with a break instruction and when it hits one of the inserted break instructions at the entry point of a function, probe codes are inlined into the function and an instrumented version of the function is moved (relocated) to shared memory. The original function's entry point is patched with a long branch instruction to point to its instrumented version that is stored in shared memory (see 4.1. algorithm).

Therefore, in view of the broadest reasonable interpretation above, Applicant's argument that Hundt does not disclose the limitations in the claims is not persuasive. Accordingly, the rejections of claims 1, 7, and 13 are maintained.

Per claims 2-6, 8-12, and 14-24:

The applicant states that claims 2-6, 8-12, and 14-24 are allowable as being dependent on the allowable base claims. As has been shown above, the rejections of the independent claims 1, 7, and 13 by Hundt are maintained, therefore, the argument that claims 2-6, 8-12, and 14-24 are allowable as being dependent on the allowable base claims is considered moot. Accordingly, the rejections of claims 2-6, 8-12, and 14-24 are also maintained.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-F 7:30-4 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on 571-272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

I. Kang
Examiner



KAKALI CHAKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100